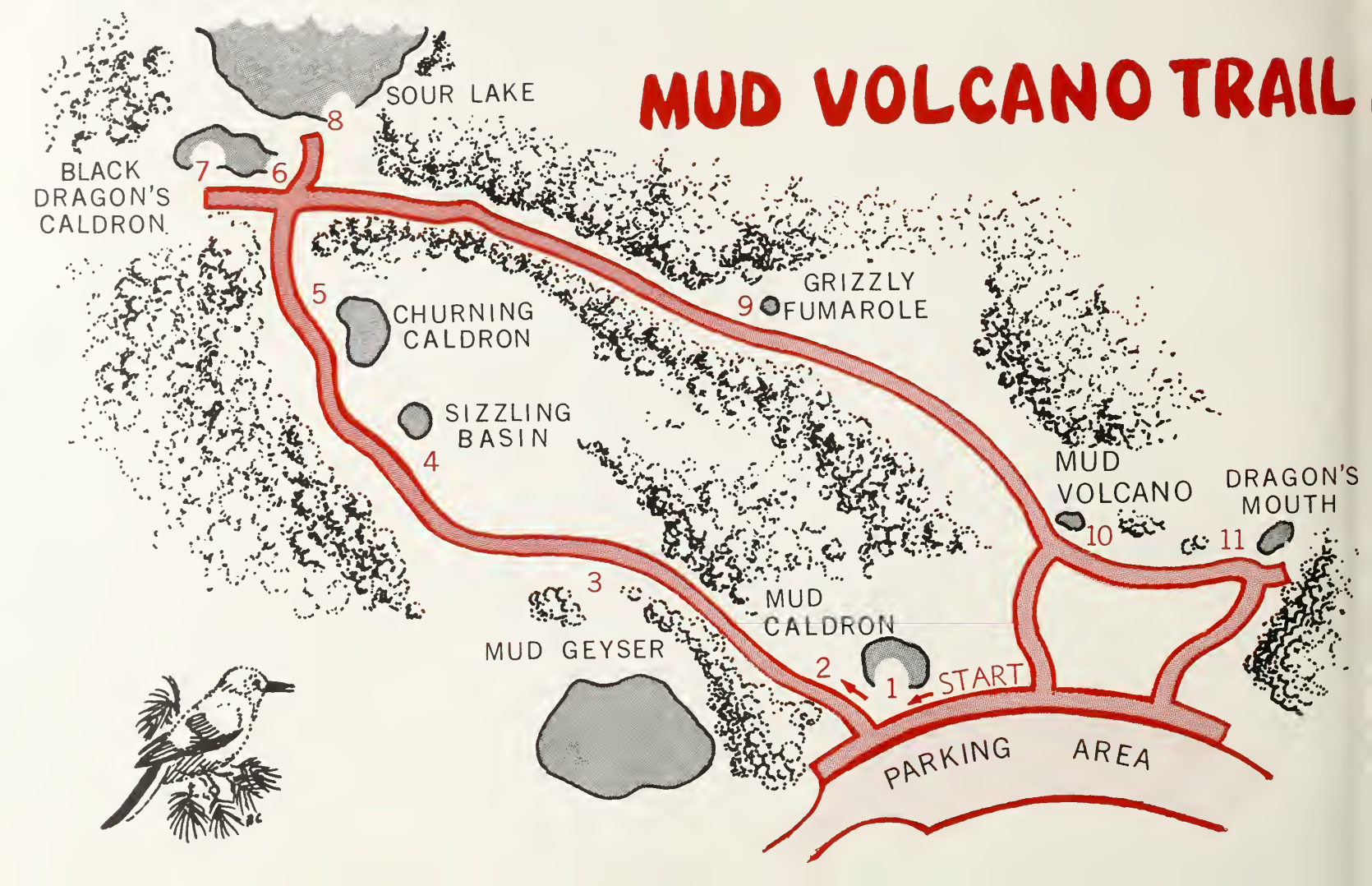
MUD VOLCANO TRAIL
YELLOWSTONE NATIONAL PARK


MUD VOLCANO TRAIL
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START
PARKING AREA

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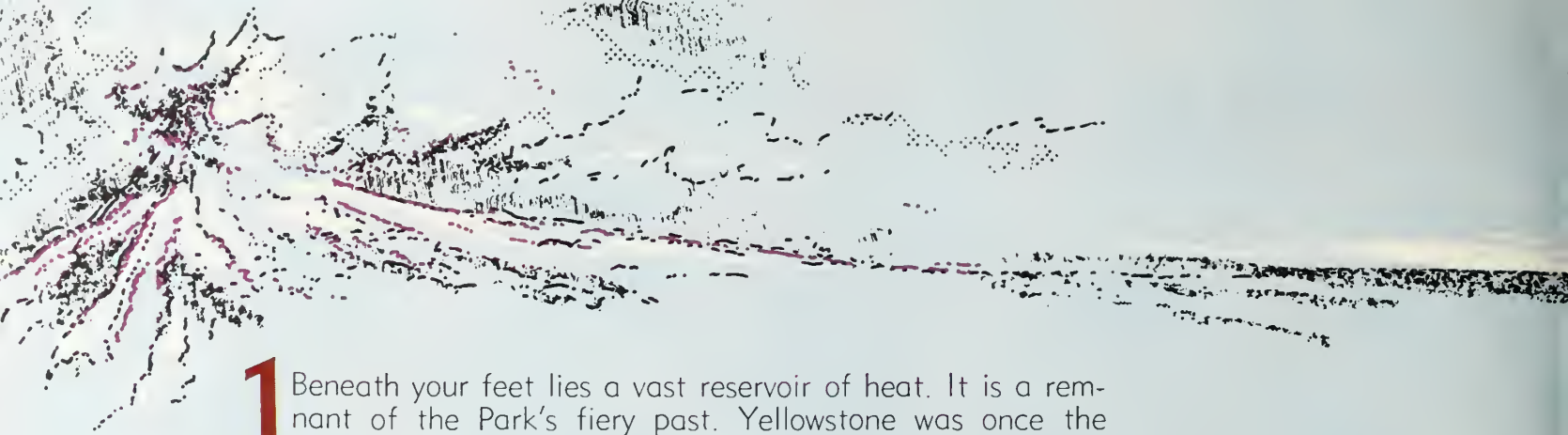
Turbulent pools of hot muddy water, hissing steam, strange odors, a bleak and barren landscape — this booklet will help you to better understand these curious features.

The numbered statements which follow refer to locations along the trail marked by numbered signs. To follow the trip outlined here will take you about ½ hour and will require a walk of 2/3 of a mile.

DANGEROUS THERMAL AREA

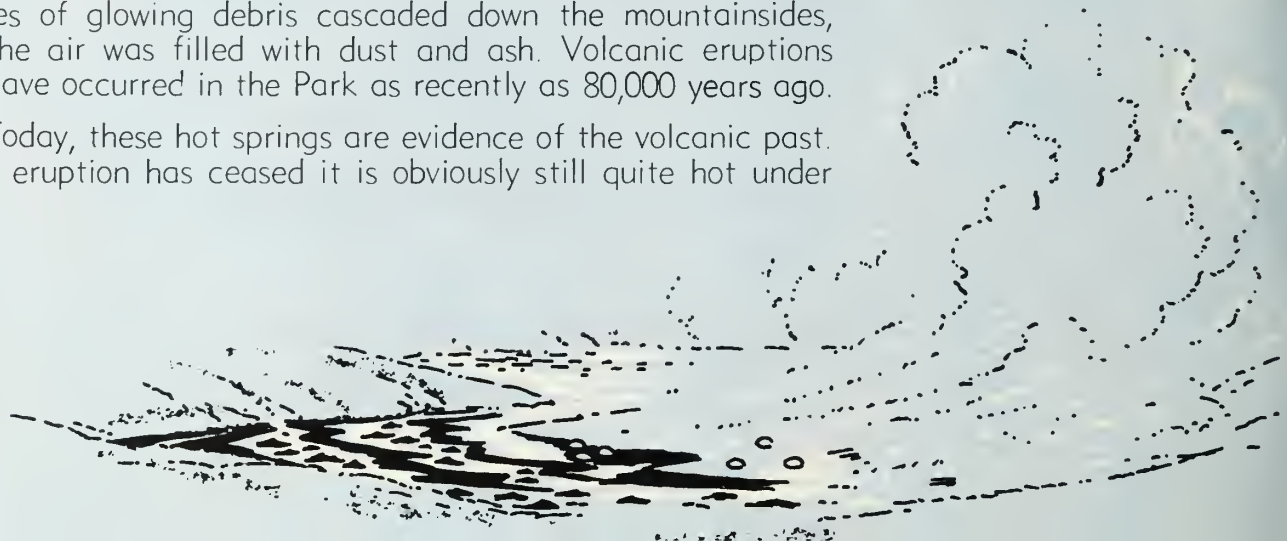
Boiling Water — Thin Crust

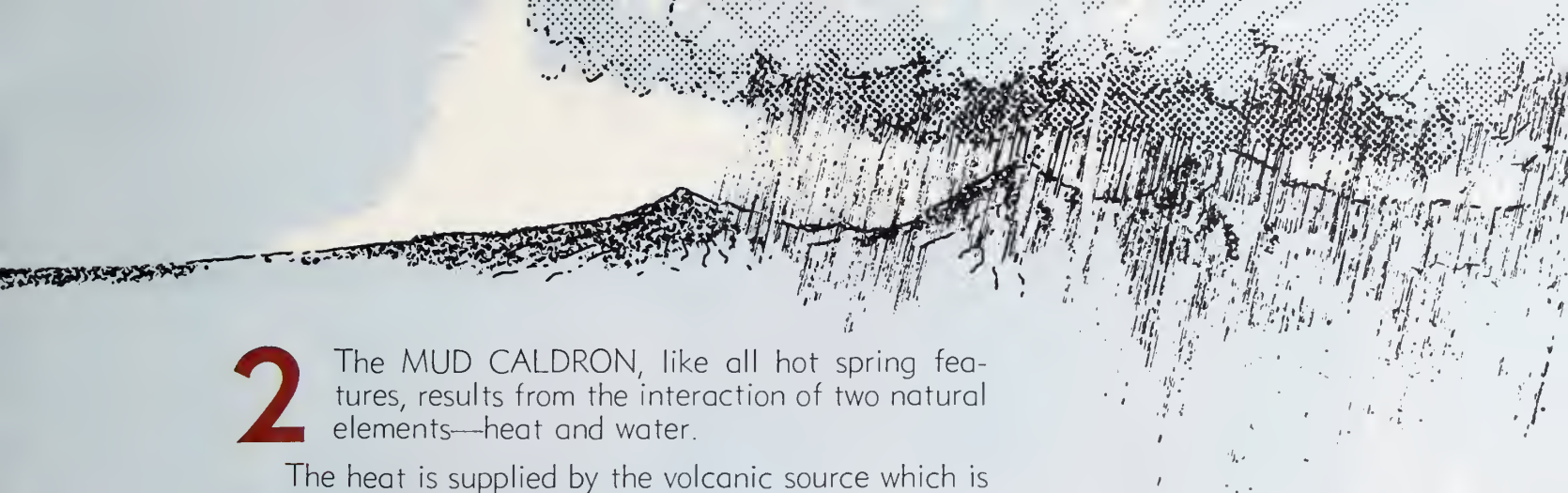
Always Stay on Designated Trails



1 Beneath your feet lies a vast reservoir of heat. It is a remnant of the Park's fiery past. Yellowstone was once the scene of volcanic holocaust. For years great fissures in the earth spewed forth tremendous quantities of molten rock. Avalanches of glowing debris cascaded down the mountainsides, and the air was filled with dust and ash. Volcanic eruptions may have occurred in the Park as recently as 80,000 years ago.

Today, these hot springs are evidence of the volcanic past. While eruption has ceased it is obviously still quite hot under foot.



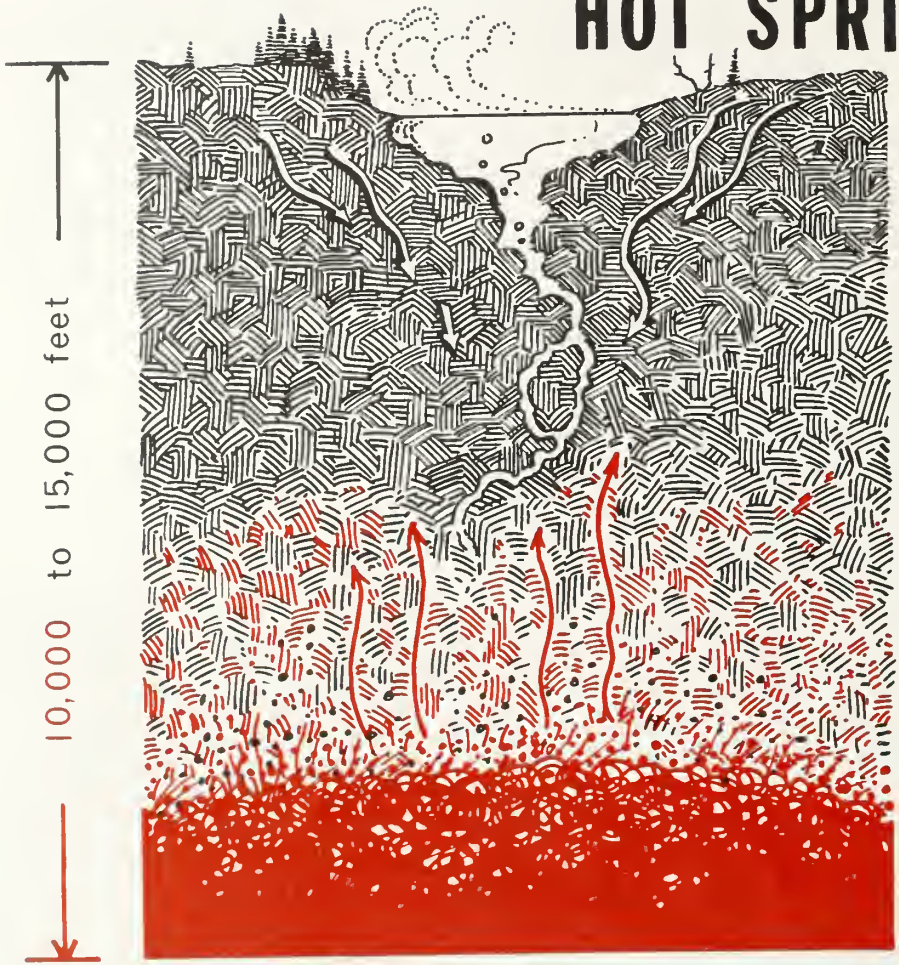


2 The MUD CALDRON, like all hot spring features, results from the interaction of two natural elements—heat and water.

The heat is supplied by the volcanic source which is but shallowly buried here in Yellowstone.

Most of the water is rain water and melted snow. This water seeps down into the ground, is heated by the volcanic source, and rises again to form a hot spring.

HOT SPRING



Surface water seeps into ground

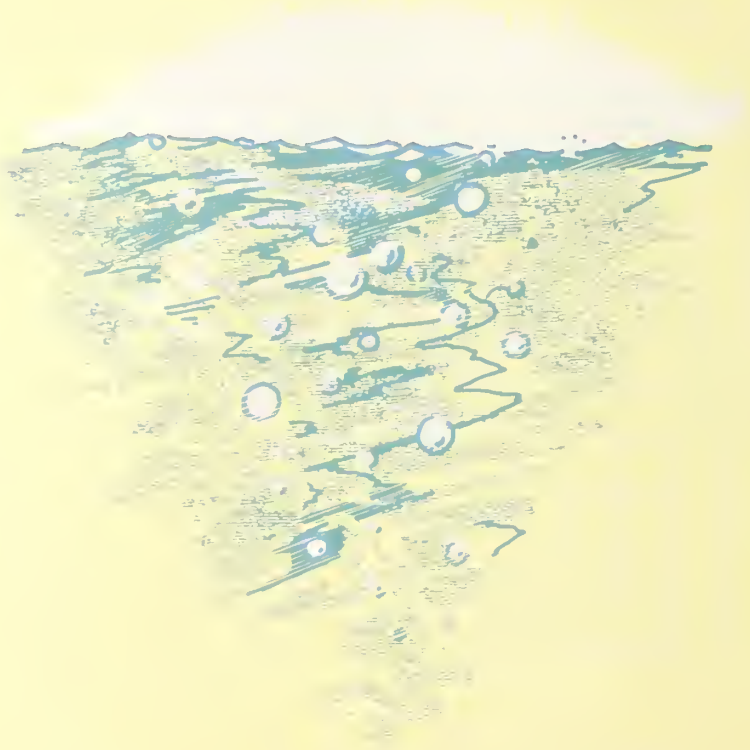
Water absorbs heat from rock and gases

Hot rock and gases

Volcanic source - Molten rock

3 How is the water of a hot spring heated? The only sure way to find this out would be to get a look at the "roots" of such a spring. But as you look down to the MUD GEYSER below you, it takes little imagination to realize what an impossible task this would be. As a result, we can only guess at what the actual mechanism of hot spring development may be.

Geologists feel that the down-seeping waters may not actually contact molten rock. They believe that most of the heat is transferred from the volcanic source to the circulating water by conduction through rock. Rising gases may also be involved in the heating process.



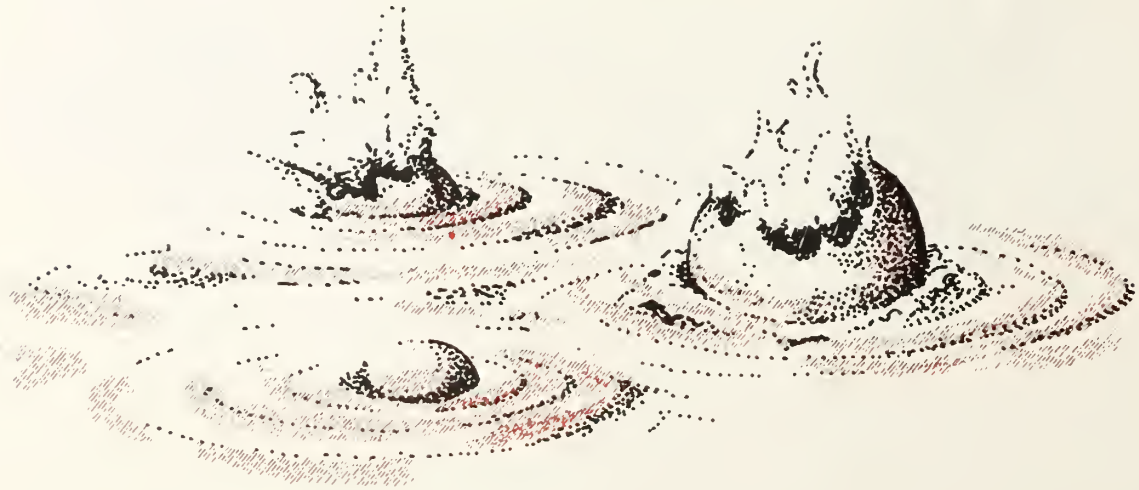
4 You have probably already noticed the odor of "rotten egg gas". This is the smell of hydrogen sulphide, one of the gases which arises from these hot springs.

The pools before you are called SIZZLING BASIN. The water seems to be boiling, but it is not. The bubbling action is due to gas bubbles.

The most important volcanic gases found in the Park's hot springs are STEAM, CARBON DIOXIDE, HYDROGEN SULPHIDE and HYDROGEN. While steam is the most abundant of these gases, it is largely condensed as it mixes with ground water, and at the surface of the pool other gases may appear more prominently. The foam and bubbles floating on the surface are carbon dioxide.

5 Here at CHURNING CALDRON the action of gases is again clearly seen. The water temperature is about 100°F. The acid water teems with microscopic one-celled algae, some of which swim freely through the water. During certain times of the year a heavy mat of dark filamentous algae covers much of the water surface.

6 The cracks and fissures through which the volcanic gases rise and through which the surface waters descend are forever changing. This spectacular spring did not exist prior to 1948. In the spring of that year, subsurface changes occurred and the BLACK DRAGON'S CALDRON burst into existence. It has since slowly shifted some 200 feet from the point at which it first formed. Prior to the formation of this seething mass of black mud, the spring which feeds nearby Sour Lake was much more active than at present. We can speculate that underground changes diverted heat energy from Sour Lake to form Black Dragon's Caldron.

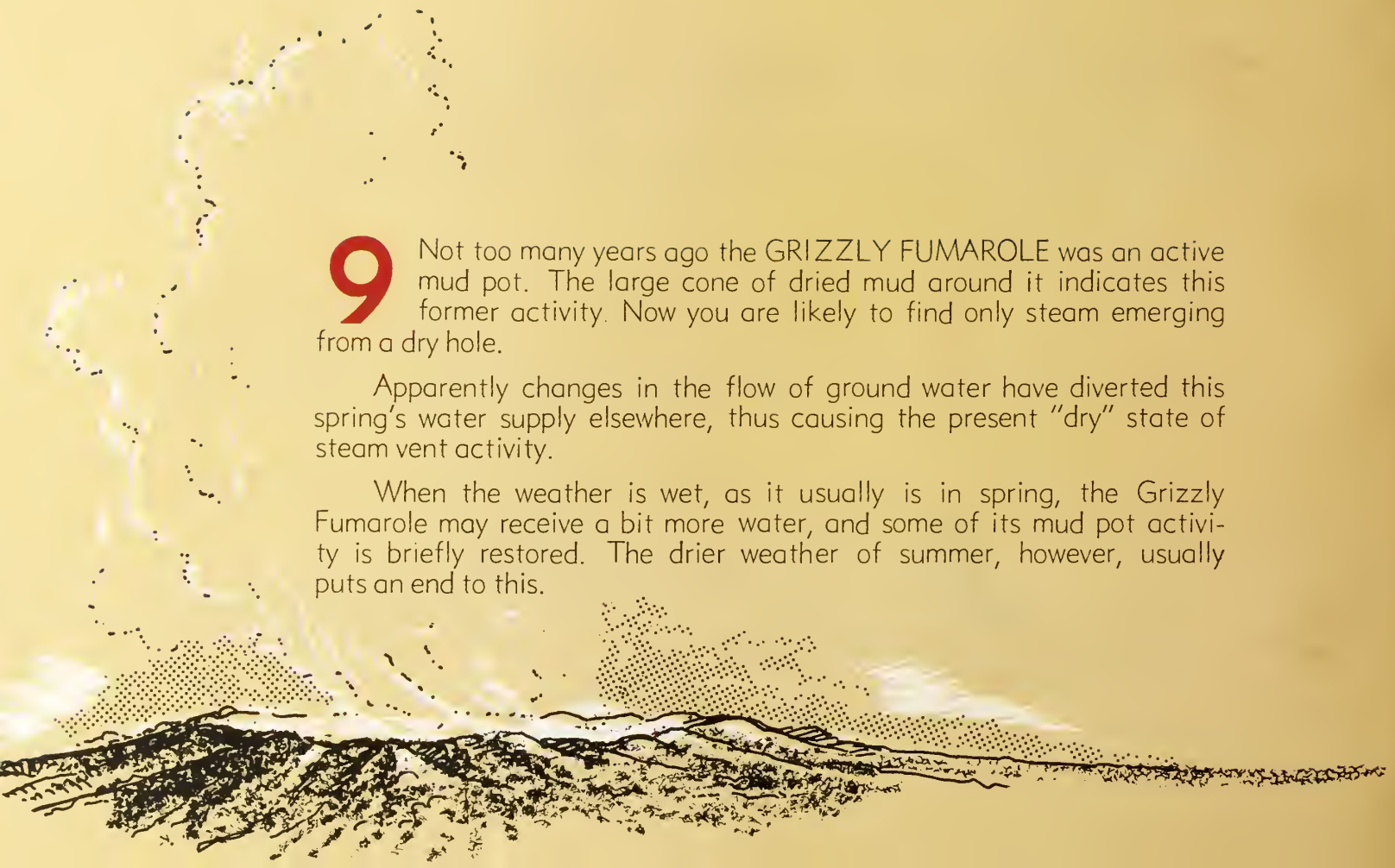


7 The water supply of the Black Dragon's Caldron is limited. You can see that it produces little or no runoff. The emerging gases churn the water over and over leaving it thick and muddy. The mud confines the rising gas to large bubbles which, as they burst at the surface, produce the explosions of mud which give this spring so gruesome an aspect.

8 SOUR LAKE is named because of its acid water. The acid gives the water a sour taste and makes it slick to the touch. Hydrogen sulphide rising from the volcanic depths reacts with oxygen in the descending ground water to form the acid.

The dead trees within the lake indicate that it is now more extensive than it once was. Notice the dark acid burns on the remaining stumps.

The fallen trees adjacent to the walk were killed by an overflow in earlier years. Sour Lake and Black Dragon's Caldron testify to the highly unstable nature of the Park's hot spring features.



9 Not too many years ago the GRIZZLY FUMAROLE was an active mud pot. The large cone of dried mud around it indicates this former activity. Now you are likely to find only steam emerging from a dry hole.

Apparently changes in the flow of ground water have diverted this spring's water supply elsewhere, thus causing the present "dry" state of steam vent activity.

When the weather is wet, as it usually is in spring, the Grizzly Fumarole may receive a bit more water, and some of its mud pot activity is briefly restored. The drier weather of summer, however, usually puts an end to this.

10 The water of the MUD VOLCANO contains an abundance of gray mud. This mud is of the spring's own making. The highly acid water leaches materials from the surrounding lava rock. This leaves behind a clay-like residue. Mixed with the agitated water of the spring, it is this residue which gives the Mud Volcano its muddy consistency and color.

11 The rhythmic belching of steam and the flashing tongue of water as it strikes out from the cavernous opening have given this spring its name —the DRAGON'S MOUTH. The surging action gives the impression of a great discharge of water, but a glance at the runoff channel shows that this is not so. Here, too, the water is used over and over.

The nature of this pool is violent. Its hot (180° + F.) waters, its violent seething, the rumblings from its inner caverns — all create the impression of power. And this is certainly a valid impression.

The Dragon's Mouth—as are all of Yellowstone's hot springs and geysers —is powered by a source of volcanic heat buried beneath your feet. It has given rise to great volcanic outbursts in the past.

Does the Dragon's Mouth represent the dying stages of this period of violence . . . or are the great earth forces simply resting . . . only time will tell.

FROM HERE TO THE GULF OF MEXICO

Water in this thermal area has been subjected to hard treatment underground. It surfaces bearing a load of heat, gases, dissolved chemicals, and sediment. In a sense, it is naturally polluted. Nature has ways of purifying this water.

In a short distance, much of the gas and heat dissipates. Chemicals are redeposited or greatly diluted, and sediments settle out. Such a purification system has been working since the earth began.

Then why is pollution such a problem today? Think of the much harder treatment this water will receive from man after it flows out of the National Park down the Yellowstone, Missouri, and Mississippi Rivers to the Gulf of Mexico. Enormous quantities of organic and chemical wastes will be dumped into it, overloading its capacity to absorb and recuperate. The Gulf and all the oceans are now showing signs of ill health, too.

Our own health and well-being depends on the health of the environment. Think about it. When you return home, remember how rivers and lakes **can** look when we cooperate with nature.

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